U.S. PATENT APPLICATION

FOR

SPA INSERT WITH FLAT UPPER FLANGE AND INTEGRAL SPILLWAY

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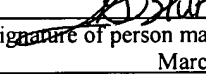
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SPA INSERT WITH FLAT UPPER FLANGE AND INTEGRAL SPILLWAY

FIELD OF THE INVENTION

The present invention relates generally to recreational or therapeutic in-ground spas and pools, and more specifically to spa and/or hot-tub assemblies that insert into a pre-formed cavity to form an integrated pool/spa structure.

BACKGROUND OF THE INVENTION

The advent of packaged pool designs in which a pool and spa (hot tub) are integrated to form a combined pool/spa system has provided designers the opportunity to design pools that are not only interesting in appearance, but functionality as well. A popular type of integrated pool/spa design is the "spillover" spa in which a spa is placed adjacent to a pool so that water from the spa spills over into the pool. This type of design often provides a desirable integration of traditionally separate pool and spa constructions, and also facilitates the addition of interesting water features, such as waterfalls or waterflows between the pool and spa.

The design and construction of integrated pool/spa systems, however, can add significant costs and complexities to a pool project. For example, the specific pool shape must be conducive to placement of an integrated or spillover spa. The spa must then be properly designed and placed in relation to the pool. With respect to specific spa design and placement, numerous factors are critical in providing the desired look and operation while allowing for installation that is not only economical, but feasible as well. Factors such as the shape of the spa and pool and the type of materials used in construction, as

well as the major sub-assemblies, like plumbing and heating are typically more critical in integrated pool systems because of the need to provide a uniform look and feel between the pool and spa, and the need to provide appropriate interaction of water between the pool and spa. Whereas a pool is typically constructed on a level plot, the associated spa can be placed at various heights either level with or above the pool. This also adds a degree of complexity in the design and construction process. The cost of adding a spillover spa to a package pool product can be quite significant due to the additional excavation, plumbing, filtration, and integration requirements.

Traditional integrated pool/spa systems utilize a spa that is excavated along with the attached pool as a single in-ground system. At present, gunite pools are the most popular design in much of the United States. In this type of pool construction, a construction crew excavates a hole, installs the plumbing and assembles a framework grid with 3/8-inch steel reinforcing rods (rebar), or similar structural material. The rebar rods are usually spaced at intervals, such as four to ten inches apart, and secured together with wire. When the grid is in place, the crew sprays a heavy coating of gunite, which is a mixture of cement and sand, around the rebar. The gunite is sprayed as a wet concrete material which is troweled smooth. After being allowed to dry, which can take up to a week, a smooth finish is applied to the rough surface. The most popular finish is plaster, which can be a mixture of cement and marble sand. Alternatively, special concrete paints, tiles, exposed aggregates, vinyl or fiberglass can be used to finish the pool surfaces. The advantage of a packaged gunite pool and spa is that the system is effectively one unit and made of the same material, thereby ensuring a uniform

appearance and style. Also, as an integral unit, the plumbing and heating systems are often integrated at the design and manufacturing stage, thus simplifying installation. A disadvantage of this type of system, however, is that modification of the design or replacement of any the spa components or spa surface is very difficult due to tight integration with the pool.

To accommodate integration with existing pools, a number of pre-made spillover spas have been developed. These are typically pre-cast spa units that are pre-plumbed in pre-formed shells that are designed to interface with the main filtration equipment of an existing pool. Such assemblies, however, often have various drawbacks in design, construction and installation. Although they are designed to be readily installable components, they are often not designed to provide a truly integrated, flush look with the surrounding pool structure and masonry. Consequently, they lack the uniformity of appearance that can be achieved in traditional poured concrete/gunite pool and spa systems. For example, existing non-traditional spa systems (such as acrylic or fiberglass replacement spas) often possess no integration-assisting features, and protrude from the surrounding pool/patio in an unappealing manner. For pool and spa systems that require a specific aesthetic look or structure, this lack of integration presents a significant obstacle to overcoming the associated cost of such a system.

Another drawback with many present pre-formed spa assemblies, particularly with respect to replacement spas, is that they typically do not provide for adequate attachment to the existing surrounding structure or walls (e.g., gunite). Thus, present assemblies and methods frequently require installation and positioning construction or

hardware that present further cost and complexity to the installation process. These systems also often require extensive rework of the existing water-flow, suction, skimmer and/or additional waterfeature systems, particularly with respect to the associated or necessary flow routes, filtration and valve requirements.

SUMMARY OF THE INVENTION

A spa insert for incorporation into an existing or new packaged pool/spa system is disclosed. The spa insert assembly is comprised of a shell portion and one or more plumbing elements. The shell portion includes a flat upper flange, an integral spillway, and a notch near the waterline for accepting masonry in a manner that allows for total integration of the assembly into an in-ground pool or spa infrastructure. The disclosed assemblies are suitable for use in both hot or cold water installations, and integrate seamlessly with specific pool or spa waterfeatures. In one embodiment, the shell is made of a vacuum-formed acrylic sheet that is formed, plumbed, and/or fiberglassed according to specific methodologies. The disclosed pool/spa package assembly provides a simple insert designed to replace the general, more complex in-ground assemblies, and represents a solution that is manufactured more readily, costs less, and can be installed in a much shorter time.

The spa insert is designed to fit into the gunite or concrete spa cavity of a new or existing in-ground pool. The top flange of the spa shell is flat, which allows the spa insert to fit flush into the spa cavity at the bond beam/spa dam wall portion, and to be fastened directly to the pool/spa shell. This prevents movement of the shell during the backfilling portion of installation, as well as providing a solid foundation for the installation of the masonry finish work. The spa insert includes a spillway, which allows water to flow between the pool and spa in the same fashion as a traditional gunite packaged pool/spa system. In order to limit the movement, the spillway is also fastened to the gunite spa dam wall and covered with masonry in tile or rock. A notch is located

approximately six inches below the top of the spa for installation of traditional tile or waterline rock, thus maintaining the look of a traditional gunite spa.

Other objects, features, and advantages of the present invention will be apparent from the accompanying drawings and from the detailed description that follows below.

BRIEF DESCRIPTION OF THE DRAWINGS

The present invention is illustrated by way of example and not limitation in the figures of the accompanying drawings, in which like references indicate similar elements, and in which:

Figure 1 illustrates a perspective view of a spa insert, according to one embodiment of the present invention;

Figure 2 illustrates a partial side view of a spa insert as installed in a spa cavity, according to one embodiment of the present invention;

Figure 3 is a full side view of the insert as installed in a spa cavity for the embodiment illustrated in Figure 2;

Figure 4A is a top view of the spa insert, according to one embodiment of the present invention;

Figure 4B is a side view of the spa insert flange, according to one embodiment of the present invention;

Figure 5 is an illustration of a spa cavity for receiving a spa insert, according to one embodiment of the invention;

Figure 6 is an illustration of a spa insert placed in a spa cavity, according to one embodiment of the present invention; and

Figures 7 is an illustration of a spa insert within a spa cavity with decorative rocks placed on the upper surface of the spa insert flange, according to one embodiment of the present invention.

DETAILED DESCRIPTION OF THE INVENTION

A spa insert for the hot tub portion of a packaged pool system is described. In the following description, for purposes of explanation, numerous specific details are set forth in order to provide a thorough understanding of the present invention. It will be evident, however, to one of ordinary skill in the art, that the present invention may be practiced without these specific details. The description of preferred embodiments is not intended to limit the scope of the invention or the claims issuing therefrom.

The assembly (also "spa" or "spa assembly") of the present invention is an insert designed to fit into the spa cavity of new or existing in-ground pool structures. The spa cavity comprises an excavation or similar construction that is typically placed adjacent to a partially or fully in-ground pool structure. The completed packaged pool system comprises the pool and adjacent spa, which is arranged so that some of the water from the spa intermingles with the pool, typically by flowing into the pool via a passageway or waterfall.

Typical present known spa assemblies are comprised of pre-formed shells that typically have pre-defined, generally hemispherical upper lips. One example of such spa assemblies is the traditional fiberglass spa assemblies that have a rounded upper lip around the tub, with perhaps an extended portion that contains all of the spa controls. The curved or rounded surface is safe and comfortable to the touch, since people often lean or even sit on this upper section of the spa. Because of these uses, traditional fiberglass spas leave exposed a large portion of the fiberglass structure. These spas can only be made to match the surrounding pool structure by utilizing a particular color of fiberglass or housing.

material. In any case, such solutions are typically artificial and do not truly accomplish the complete integration of the spa with the surrounding environment.

Unlike stand-alone spa or "jacuzzi" structures, embodiments of the present invention are intended primarily to be installed as an "insert" that becomes an integral part of built-in pool infrastructure while maintaining the uniform appearance that a traditional in-ground spa has with the surrounding masonry.

Figure 1 illustrates a spa insert for use in a packaged pool assembly according to one embodiment of the present invention. As shown in Figure 1, the assembly 100 is shell that is comprised of a tub portion 120, an upper flange 126 and a spillway 124. The assembly 100 further includes plumbing elements 130 attached or otherwise associated with the shell tub portion 120. These plumbing elements are related to the suction or the return water flow within the spa assembly. Spa assemblies, such as the assembly 100 shown in Figure 1, can also include water jets 140, and any additional, necessary components for the water jets 140.

As illustrated in Figure 1, the top surface 122 of the upper flange 126 is preferably flat or nearly flat. This allows the spa insert to fit flush in the spa cavity of the associated pool structure. The flat upper flange (or "lip") 126 allows for seamless integration into the existing masonry. It provides a structure that allows for robust installation and attachment, as well as a platform for the installation of decorative elements, such as tile, brick, stone, veneers, and the like.

As an insert that can be installed directly into the framework or outer structure portion of an in-ground pool or spa, the footwell of the spa can be set directly on the floor of the surrounding in-ground structure. The flat flange 126 at the spa cap allows for integral

fitting to the upper wall of the surrounding structure. In these embodiments, this flange could sit on the gunite portion of the spa bond beam and dam wall, and can be fastened using a variety of fastening means (e.g., stainless steel or bronze bolts or fasteners), directly to the bond beam and dam wall to prevent any movement or separation from the pool/spa shell.

Figure 5 illustrates a spa cavity into which a spa insert can be fitted, according to embodiments of the present invention. As shown in Figure 5, the spa cavity 500 is typically a cylindrically shaped cavity that is formed of concrete or similar material. Depending upon the final configuration of the packaged pool system, the cavity can be placed at an appropriate location adjacent to the pool, and can be of a shape and size appropriate to accept a spa insert, such as that illustrated in Figure 1. In one embodiment, the spa cavity 500 is a gunite construction, in which a hole is excavated, and a rebar (steel reinforcing rod) framework 502 is assembled. With the grid in place, a heavy coating of gunite (a mixture of cement and sand) is sprayed around the rebar. Once dry, the exterior portion of the gunite cavity can be painted, coated, or otherwise finished to provide a desirable appearance. The inside surface of the gunite cavity can be left unfinished, since the use of a spa insert eliminates the need to finish the inside of the spa cavity. One or more access ports 504 formed in the gunite cavity 500 allow for the hookup of any necessary plumbing and electrical connections. These access ports can also allow an opening for the backfilling of sand around the installed spa insert. Notches 506 also represent a type of opening that can be used to backfill around the spa insert once it is placed in the cavity.

The cavity 500 also includes a spillway recess 508 that is provided to accommodate the spillway of the insert, such as spillway 124 in insert 100. This recess provides for the flush mounting of the insert within the spa, and also helps hold the insert in place while it is fitted and fastened to the cavity. It should be noted that various different spillway and spillway recess configurations are possible, depending upon the design and implementation of the spillway. For example, the spillway could be recessed within the upper portion of the cavity as shown, or it could be designed to wrap up and over the side of the cavity, or even protrude through an opening formed in the wall of the cavity, or any other similar configuration.

As stated above, the spa cavity 500 is preferably made of gunite. In an alternative embodiment, the spa cavity can be formed using poured-concrete. This method is similar to gunite, but instead of spraying concrete material around a rebar framework, concrete is poured into a wooden form. As a further alternative embodiment, the spa cavity can be manufactured from masonry block, in which walls are constructed with concrete blocks, or similar building materials.

Figure 2 is a partial side view of a spa insert 200 placed into a spa cavity 202. Once the insert is placed into the cavity, the cavity is backfilled with sand 204, or a similar material. The spa insert 200 includes a footwell portion 210, which is the bottom of the spa, that rests on a support 212 placed in the spa cavity. The support 212 can be a mortar base or similar structure. The walls of the tub portion of insert 200 can be formed at an angle, as shown, or vertically, depending upon the configuration desired by the user.

The insert 200 also includes flange 206, which attaches and bonds to the upper edge of spa cavity 202, through a beveled or notched interface, as shown. The size of the flange 206 can be varied, depending on the size of the mating surface of the spa cavity shell that the insert rests upon. In most applications, the flange 206 will be approximately three to five inches wide. Decorative masonry, such as tiles or stones 208, can be placed on top of the flat portion of flange 206 to integrate the spa with the surrounding pool and/or environment. A notch or circumferential recess 214 can also be formed in the insert 200 to accommodate the placement of tiles or stones along the upper inside surface of the tub to further complete the "integrated" appearance of the spa.

Figure 3 is a full side view illustration of a spa insert placed into a spa cavity, for the embodiment shown in Figure 2. As illustrated in Figure 3, the spa insert 300 includes a spillway 304, which may be a trough or pathway cut or formed in the upper portion of the insert. The dimensions, position, and angle of the spillway can be manufactured in a variety of different ways, depending upon the constraints of the design and final pool/spa installation. For example, in a typical embodiment, the spillway 304 may be 18 inches wide by three inches high and formed as an indent or groove along the upper surface of the spa insert, thus forming a channel through the flange. Alternatively, the spillway can be formed as a slide that drops down from the upper surface of the spa insert and flange. Other similar alternatives can also be used to embody the spillway that is formed as a unitary (integral) part of the spa insert.

Also illustrated in Figure 3 is the fixing of the insert 300 to cavity 306 through bolts 302. The spa insert may be first glued or bonded to the top of the spa cavity 306 then fixed

by fasteners, such as bolts 302, twist lock fasteners, screws, or similar means, to provide a robust and secure installation.

Figure 4A is a top view of the spa insert illustrated in Figure 1. The spa insert includes a footwell 402, which is surrounded by a bench 403. A step 408 may be provided to facilitate entry to the spa. The spa flange 404 surrounds the side of the spa insert and may include a plurality of bolt holes (e.g., 3/8" holes or similar depending on the size of the bolt or fastener) 410 for attachment of the insert to the spa cavity. The top surface of the flange 404 may be scored in a random or cross-hatch pattern 412 to facilitate the bonding of masonry along the edge of the spa assembly. Figure 4B illustrates a detailed cross-sectional side view of the flange 404 showing the scored surface 412. For affixing the masonry to the top of the flange, an epoxy 414 or similar adhesive may be used. Scoring the flange helps strengthen the adhesive bond between the masonry and the spa insert. Instead of scoring the flange surface after construction, the spa flange and/or the cavity mating surface can be manufactured in a very rough surface to allow the transition from a plastic or acrylic base material to a mortar or cement base material.

As illustrated in Figure 4A, the spa insert includes a spillway 406. As shown in Figure 3, in one embodiment, the spillway is a notch or groove, or similar indent that is formed or cut into the top portion of the spa insert, through the flange. The spillway allows water to flow freely from the spa to the pool, maintaining the traditional method of in-ground pool/spa filtration. The use of a spillway allows for the elimination of a traditional fiberglass spa skimmer from the top portion of the spa just below the waterline. The water is filtered through the pool filter during normal filtration by way of a common return line

between the pool and the spa. For normal spa use there are two spa suction lines located at the base of the spa footwell 402, as in a more traditional gunite spa configuration. In one embodiment, the spa assembly includes two suction inlets, instead of the usual one. These are illustrated as element 308 in Figure 3. The dual suction located in the spa footwell also allows for a normal spa draining customary to an in-ground assembly. This design represents a significant improvement over existing systems for several reasons. First, the absence of skimmer plumbing means that the users have a much simpler system, a system that does not require the user to undergo multi-step cleaning operations to provide the desired result. Second, this embodiment does not require placement of plugs within these upper skimmer holes to drain the spa, avoiding the need for owners to be knowledgeable in the more complicated principles of operation of the skimming functions of the spas, and thereby avoids any problems/damage caused by errant operation of these skimmer functions.

Embodiments of the present spa assembly also provide for increased user comfort. The insert assembly can be designed in several configurations other than the traditional straight walls and benches found in most in-ground spas. In most in-ground spas, there are only four to six jets, which are all typically placed at the same depth from the top of spa, with the jet "height" being adjusted by merely adjusting the height of the spa bench. Though the bench height and footwell depth are determined by the mold used to form the insert, the number of jets and their locations are virtually unlimited in the assembly shell, allowing for a much more comfortable and therapeutic spa, while maintaining the appearance and uniformity of a traditional in-ground spa.

Operating controls for controlling various factors such as water temperature, jet flow, and the like can be located in a single, readily accessible window region on the side of the tub surface. The controls may be provided at a console that is separate and outside of the spa. For configurations in which the controls are placed within the spa and below the waterline of the tub, a waterproof console with touchbutton or similar controls can be provided.

Once the spa insert has been formed and installed with the appropriate plumbing fixtures, it is ready to be inserted into a spa cavity, such as cavity 500 illustrated in Figure 5. After the assembly has been set in place and plumbed, the remaining space between the in-ground spa walls and the spa insert (with the associated plumbing/electrical lines) is back-filled with sand and water-jetted to achieve maximum compaction around the assembly. The fasteners in the spa lip, which fasten the assembly to the in-ground pool/spa structure, allow this water-jetting to take place without the fear of floating the assembly. The access notches 506 along the edge of the spa insert facilitate the backfilling and water jetting operations. The installation of the insert in the cavity is illustrated in the cutaway diagram of Figure 3, and illustrated in the perspective view of Figure 6.

As can be seen in Figure 6, the spa cavity 602 is formed of gunite or concrete and placed adjacent to a cavity that forms an in-ground pool. The insert 604 fits into the spa cavity and is held in place by the flange 606. A spillway 608 allows for spa water to fall into the adjoining pool. The spa cavity is embedded with rocks 610 or other decorative masonry elements. The flange on the spa insert allows for the installation of similar masonry elements along the top surface or border of the spa. Figure 7 illustrates the

completed spa assembly with masonry tiles or stones 702 installed on the top portion of the spa assembly.

As shown in Figure 7, one installation advantage of embodiments of the present invention pertains to the simplicity of matching the surrounding masonry. The flat flanged portion of the spa insert allows masonry (i.e., brick, rock, coping stone, etc.) to be installed in a more preferable fashion to the pool/spa, keeping the appearance of a traditional in-ground pool/spa. In some embodiments, a notch is located below the flat fastening lip of the spa to allow installation of traditional waterline tile or masonry in a novel manner. This notch is illustrated as element 214 in Figure 2 and element 612 of Figure 6. The notch can be designed in a variety of different sizes depending upon the design and installation constraints. For the embodiment illustrated in Figure 2, the notch 214 is shaped in a size approximately six inches high by one and one-half inch deep. Figure 7 illustrates the placement of tiles or similar items 704 within such a notch in the final finished spa assembly.

In one embodiment, the spa insert 100 illustrated in Figure 1 is manufactured using a fiberglass and gel coat. This is accomplished by using a mold to define the shape of the insert. To the mold is first applied a colored gel coat, which is then sprayed or hand laid with several coats of fiberglass. After the shell has been completed, the plumbing is installed. The installation will vary depending on the number of jets and their location within the tub portion of the spa. After completion of the spa plumbing, the spa insert is pressure tested to ensure that it is free of leaks. A spray foam insulation is then sprayed over the fiberglass and plumbing.

In an alternative mode of manufacture, the insert is formed by a vacuum forming method. In this method, a flat sheet of plastic is used. It is heated to a soft pliable state and placed over a vacuum mold. The vacuum created pulls the soft plastic into its final shape. After cooling, a colored gel coat is then applied and the plumbing is installed, as described above with reference to the fiberglass embodiment. Besides plastic, any comparable material, such as acrylic, resin composite, Lucite, or even carbon fiber, can be used.

The use of acrylic or fiberglass assemblies for the spa insert confers numerous benefits over current gunite spa structures. The spa assembly using an insert placed in the spa cavity can include insulation, typically foam insulated as part of the manufacturing and assembly process. The insulating material can be used as part or all of the backfilling material 204. The use of insulation provides greater energy efficiency than typical in-ground systems. For example, the insulated spa insert configuration allows the spa to heat in approximately one-quarter the time of traditional in-ground or gunite spas. Not only is this convenient and time efficient for the owner, but it is also provides a significant savings on the use of gas, propane, or other heating energy source. While a traditional in-ground spa with a cover, when heated for use will lose approximately 50% of its heat overnight due to the concrete construction and lack of insulation. An insulated assembly according to the disclosed embodiments will maintain approximately 80% of its heat in the same time period. Therefore, using the spa on consecutive days will impose a minimal cost in maintaining the desired operating temperature.

In the foregoing, a spa insert with integral spillway for insertion in a packaged pool system has been described. Although the present invention has been described with

reference to specific exemplary embodiments, it will be evident that various modifications and changes may be made to these embodiments without departing from the broader spirit and scope of the invention. Accordingly, the specification and drawings are to be regarded in an illustrative rather than a restrictive sense.

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